

## SECTION 425

### PULL BOXES, SPLICE CABINETS, AND MANHOLES

425.1 GENERAL: This work shall consist of furnishing and installing pull boxes, splice cabinets and traffic signal manholes in compliance with the specifications, the details shown on the plans, and Standard Drawings at the locations shown on the plans, or as established by the ENGINEER.

#### 425.2 REFERENCES.

- 425.2.1 American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications, Latest Edition
- 425.2.2 American Society for Testing and Materials (ASTM) Standard Specifications, Latest Edition
- 425.2.3 National Electrical Code (NEC), Latest Edition
- 425.2.4 National Electrical Manufacturers Association (NEMA) Standards, Latest Edition
- 425.2.5 This Publication, Latest Edition

SECTION 101 PORTLAND CEMENT CONCRETE

SECTION 102 STEEL REINFORCEMENT

SECTION 501 EXCAVATION AND BACKFILL FOR STRUCTURES

SECTION 701 TRENCHING, EXCAVATION, AND BACKFILL

#### 425.3 MATERIALS.

##### 425.3.1 GENERAL

425.3.1.1 Electrical pull boxes shall be polymer mortar reinforced with heavy weave fiberglass unless otherwise approved or called for on the plans, and shall conform to the specifications and details in the plans. Electrical pull boxes are normally used in sidewalk, median and natural ground areas and shall have open bottoms installed with provisions for drainage. All electrical pull boxes shall be designed for light vehicular traffic, AASHTO H 10 loading (minimum).

425.3.1.2 Metal pull boxes shall be enclosed, watertight boxes to be installed in bridge decks and other areas only when specifically designated on the plans. All metal pull boxes shall be designed to support, in place, an AASHTO H 20 loading (minimum).

##### 425.3.2 REINFORCED POLYMER MORTAR ELECTRICAL PULL BOX

425.3.2.1 Reinforced Polymer Mortar Electrical Pull Box. Pull box materials shall be an aggregate consisting of sand and gravel bound together with a polymer and reinforced with a heavy-weave fiberglass. The material shall have a minimum strength of 11,000 psi in compression, 1,700 psi in tension and 7,500 psi flexural strength.

425.3.2.2 The minimum acceptance criteria for material retention of 75% of control specimen values for load and deflection, no more than 2% change in weight or any dimension, no visual cracking, crazing, checking, blistering, or surface pitting. Changes in color will be permitted only if the change does not indicate degradation of material and will not be detrimental to the overall appearance of the product. In addition to the standard tests the material must have been tested at - 50°F and 140°F and have met the minimum criteria stated above.

425.3.2.3 The covers shall be made of heavy duty reinforced polymer mortar, unless otherwise shown on the plans, and shall be designed for a minimum for 15,000 pounds over a 10" square with a minimum test load 22,568. Covers shall be provided with flush lifting eye(s) and two openings for bolting the cover down.

##### 425.3.3 METAL PULL BOX

425.3.3.1 Metal pull boxes shall be of external recess flanged, closed bottom type designed for flush mounting in concrete, conforming to the dimensions shown on the plans. All metal boxes shall be designed for vehicular traffic (AASHTO H20 loading), except installations in sidewalk areas where the plans specify a minimum of AASHTO H10 loading. All metal boxes shall be fabricated from cast iron with a hot-dipped galvanized finish.

425.3.3.2 Covers shall be of galvanized cross-ribbed cast iron or ductile iron, designed for the required loading. The covers shall be fastened to the boxes with stainless steel or brass screws, sealed with a neoprene gasket providing a water tight (NEMA 4) enclosure. The covers shall have a checkered (non-slip) surface with prybar slots.

425.3.3.3 Conduit entrances may be made in the field by a hole saw or as approved by the ENGINEER.

425.3.4 COVER INSCRIPTION: Pull box covers shall be inscribed or embossed "DANGER ELECTRICAL" or "ELECTRICAL" as detailed on the plans. In addition, a

bead weld or other type of permanent lettering approved by the ENGINEER shall follow this inscription to designate the specific circuit as follows:

HV High Voltage Lighting (600 Volts or Greater)  
L Low Voltage (Lighting and Rest Area Electrical)  
TS Traffic Signal  
SL Street Lighting

If a bead weld is used on a galvanized box the effected area shall be painted with a zinc-rich paint.

#### 425.3.5 SPLICE CABINET

425.3.5.1 The CONTRACTOR shall furnish splice cabinets meeting NEMA 4x with steel back panel, hasp and staple for pad locking splice bar, and Type I standard. Fabrication of splice cabinets shall be as shown on the plans.

425.3.5.2 The splice cabinet shall be new, approximately 20"x30"x8" weather tight fabricated from 14 gauge steel or 0.125 inch minimum thickness aluminum. Splice cabinets shall be furnished with a low voltage splice bars having 50 units to the foot, six connectors per unit with each unit consisting of two (2) each, three-connector non-interconnected terminals, Bell Systems Part Number 66B33-50 or approved equal. The splice cabinet shall be mounted on a Type I standard on a pedestal foundation.

425.3.6 TRAFFIC SIGNAL MANHOLES: Traffic signal manhole, rings, covers, and concrete collars shall be the type, size, and material as shown on the Standard Drawings.

#### 425.4 CONSTRUCTION REQUIREMENTS.

##### 425.4.1 GENERAL

425.4.1.1 Each electrical pull box shall be installed so that the cover is flush with the curb or sidewalk grade and no part of the box or attaching screws protrudes above the surface. When no grade is established, covers shall be placed 1" higher than the surrounding ground to provide drainage away from the pull box. Metal pull boxes in bridge decks and pavement shall be installed flush with the pavement surface.

425.4.1.2 Electrical pull box extensions shall be installed to provide additional volume as detailed on the plans and according to the details thereon.

425.4.1.3 The CONTRACTOR may install more pull boxes than shown on the plans to facilitate his work at his expense with approval from the ENGINEER.

##### 425.4.2 SUMPS

425.4.2.1 With the exception of metal pull boxes installed in concrete, all pull boxes and traffic signal manholes shall have an 18-inch deep sump below the pull box or manhole. When pull box extensions are used with pull boxes to provide extra depth, sumps shall be 30 inches deep. The rock fill shall be 2-inch maximum size. Excavation for boxes shall be of sufficient width to allow a minimum 6-inch clearance on the sides of the boxes and extensions, with rockfill provided around outside walls.

425.4.2.2 Pull boxes shall be adequately supported by solid building blocks evenly spaced around the base. Thirty-pound felt paper shall be inserted between backfill and rock fill on vertical walls. Each pull box shall include a concrete collar.

##### 425.5 MEASUREMENT AND PAYMENT.

425.5.1 Pull boxes, pull box extensions, traffic signal manholes, and splice cabinets will be measured by the unit complete in place.

425.5.2 The accepted quantities of pull boxes, pull box extensions, traffic signal manholes, and splice cabinets will be paid for at the contract unit price per unit of measurement for each of the pay items listed as shown on the bid proposal.